WHAT DETERMINES THE SAVING RATE IN WESTERN BALKAN COUNTRIES?

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ABSTRACT
This paper presents the research of saving and its determinants in Western Balkan countries. The purpose of this paper is to investigate the relationship between various macroeconomic and demographic indicators, on the one side, and gross national saving rate in Western Balkan countries including Albania, Bosnia and Herzegovina, Bulgaria, Macedonia, Montenegro, Romania and Serbia, on the other side and, using the examples from available empirical literature, to develop the model which would produce the highest number of significant variables possible, given the available data. After the model is created, it is further tested for significance and typical statistical assumptions including autocorrelation, homoscedasticity, normality, cross-sectional independence and multicolinearity. Data used for the purpose of the statistical model are collected for the period between 2000 and 2015. Results obtained show GDP, GDP growth, gross domestic savings, domestic credit, inflation, urban population and total age dependency as statistically significant, while unemployment rate, deposit rate and investment rate are insignificant. According to the the model developed, Western Balkan countries should focus on contributing to their GDP's, increasing productivity and per capita incomes, in order to improve the rate of gross national savings.

Keywords: Saving Rate, Western Balkans, Growth, Fixed Effects Model, Macroeconomic Indicators, Demographic Indicators.

1. INTRODUCTION

The role of savings has been recognized as fundamental for economic growth, long time ago. In the process of financing investments, savings are inevitable factor, therefore, any savings promotion presents promotion of economic development. When discussing the level of savings in a certain economy, two indicators are typically used – gross national saving rate and gross domestic saving rate, which usually differ significantly. The difference comes from the fact that national saving rate accounts for net transfers, while domestic saving rate does not. Furthermore, total consumption is substracted from gross national income, for national saving rate, compared to it being substracted from gross domestic product, for domestic saving rate (World Bank, 2016).

Countries of Western Balkan have undergone some significant transformations over the last fifteen years. With the help of the foreign capital, banking systems in this region developed

quickly, making further economic development easier. The region experienced overall increase in living standards and incomes, but still the level cannot be evaluated as satisfactory, as high rates of unemployment and human resources underutilization remain a problem even today. And despite the fact that financial sector developed enough to ensure the further economic progress, financial systems of these countries still have much room for development. Particularly, nonbank financial services have to be improved and special attention should be paid to capital markets development. The poor operating of nonbank financial institutions or even its nonexistence is usually a consequence of reforms of legal and supervisory frameworks taking a long time, but which are inevitable for further capital market and nonbank institutions development (IMF, 2015).

The process of Western Balkan development, after the political conflicts in 1990's, was cut by the global financial crisis that caused macroeconomic indicators deterioration, out which many did not return to pre-crisis level. Deposit rates, as rates of return offered to depositors follow the constant downward trend in the last eight years. However, when discussing the ratio of national savings to the GDP, all the countries recovered, obtaining the higher saving rates at the end of 2015 than it was in the yearly 2000s. The exception, however, are Bosnia and Albania, where saving rates either stagnated or even further deteriorated.

Detailed examination of saving rate in a certain economy or region is crucial for one simple reason – saving is inevitable in order to achieve economy's self-reliance and therefore stability. Self-reliance here means the ability of the economy to finance its investments, with the least external capital inflow possible.

Determinants of saving rate have been a subject to multiple research papers and studies - different samples produce different results and there is no unique answer to the question of determinants significance. There is, however, no doubt that indicators of economic performance are not enough when determining the national saving rate. Rather, they have to be combined with demographic ones, as the propensity to consume changes over the life cycle, making the impact of the population age structure on the rates of saving not negligible.

2. LITERATURE REVIEW

Saving is usually defined simply as a difference between income and consumption (Ma & Yi, 2010). However, some highlight that saving does not represent only accumulation of money, but "smoothing consumption in the face of volatile and unpredictable income" (Deaton, 1989). The difference could be made between private, public and na-

tional savings, where private saving refers to the amount saved by all residents of the country, public refers to savings by government, while national savings covers both private and public savings.

De Gregorio paid special attention to borrowing constraints as a variable that is expected to positively affect savings within the economy. Borrowing constraints are expected to increase saving rates, as people, when not allowed to borrow as much as they want, tend to save more (De Gregorio, 1993).

One interesting chapter from the book Education, Income, and Human Behavior contains empirical analysis conducted in order to determine the relationship between education and savings behaviour. Differences in saving behaviour between different schooling groups were noted and the results point out that average and marginal propensities to save rise with the schooling attainment of the family head, ceteris paribus (Solmon, 1975).

Focus of this paper is on the actual determinants of saving rate in Western Balkan countries. Determination of the factors that affect the saving rates most significantly allows policymakers to form efficient and effective policies which would lead the economy towards desired results. Economic literature provides significant number of research papers where different models were developed in order to find out which factors exactly need to be managed in order to achieve satisfying saving rate. On the one side, there is a number of papers analyzing saving rates in specific countries over the certain period of time. On the other side, there are empirical evidences where data on savings and its potential determinants are collected for group of countries and further analyzed for significance. This section presents examples of both cases.

From Begovic and Ciftioglu's evidence on the relationship between savings and growth from Central and East European countries, there are several factors pointed out that could possibly affect these countries saving rate. Amongst others, global crisis was the reason of national savings rate of countries decline because of the reduced income per capita rate and expansionary monetary and fiscal policies applied as a response by countries in crisis. Another point of the author on this subject was the accelerated financial integration and EU membership or candidacy. Financial integration usually increases bank density and credit to GDP ratio which negatively affects saving rates, while EU membership or candidacy causes precautionary household savings to decrease, having the same impact on national savings as financial integration (Ciftcioglu & Begovic, 2010).

In the case of Japan's saving rate, using the data from 1955 to 1987, it is shown that the primary determinant of the saving rate was age

structure of the population, due to the rapid increase in the number of people aged 65 or more, relative to the working population. Besides age structure, growth rate of income, unemployment rate and inflation are shown to be statistically significant variables. (Horioka, 1991)

In one of the analyses of Nigeria's saving rate determinants in the period between 1985 and 2011, two models are developed. First model included per capita disposable income, trade openness and real interest rate as independent variables. Second model expressed GDP as a function of aggregate savings, interest rate, inflation, investment rate, exchange rate and foreign direct investment. In the case of the first model which was focused on the determinants of saving, only per capita disposable income is shown to be statistically significant. Second model also produced only one significant variable – FDI, while savings turned out to be statistically insignificant as determinant of GDP (Ozioma, 2013).

In 2006, Kuijs was dealing with China's savings-investment balance. He developed the model using the data for 232 countries, in time period of 1960-2004. Data were expressed as 5 year averages. Variables that turned out to be significant in determination of saving rate were GDP per capita, credit to GDP ratio, real interest rate, public saving, old age dependency ratio and share of industry in GDP. On the other side, variables that were not statistically significant were GDP per capita growth, inflation, young age dependency ratio and urbanizaton rate. Policies proposed by author are those that promote wage increase, income inequality reduction and exchange rate appreciation (Kuijs, 2006).

A model example from Egypt contained real GDP growth rate, consumption rate, inflation rate, investement rate and unemployment rate as independent variables to determine the national savings rate. Out of the named variables, inflation and consumption rate were not statistically significant and the model overall is accepted as significant with adjusted R2 being around 0.7. For the purpose of analysis, data were collected from 2000 to 2014. Recommendations by author for boosting the saving rate in the economy include investment in renewable energy, income tax increase and providing incentives for producers (Esmail, 2014).

Another model was developed for 21 OECD countries and it contained eleven explanatory variables – public saving, corporate saving, income per capita, growth rate of household disposable income, unemployment rate, real interest rate, inflation rate, ratio of people aged 65 and over to the working-age population, shares of direct and indirect taxes in general government tax revenue, government transfers to the household sector and net of social security contributions paid by

households and finally, ratios of outstanding consumer debt to GDP and number of outstanding credit cards per capita. Data were collected for the time period between 1975 and 1995. Regression showed public and corporate saving, growth, and demographics, inflation, unemployment, the real interest rate, and financial deregulation to be significant variables in this model. However, this model was not developed for national savings rate determination, but the household saving rate (Callen & Thimann, 1997).

In empirical evidence on determinants of saving rate from Pakistan, where thirty-year data were used, it was examined how inflation, real interest rate, real GDP growth rate and government current expenditure affect the saving rate. Time period for which the data were collected was 1980 to 2010. As the regression results of this study detected, three out of four variables are shown to be significant and all the three negatively affect the saving rate. The insignificant variable in this case was GDP growth (Aleemi, Ahmed, & Tariq, 2015).

In another similar research Turkey is used as an example. Data were gathered for the time period of 1985 to 2010. Main model in this example examines the role of inertia, current account deficit, crowding out effect, shadow economy, public policy variable of public savings, income inequality, exogenous shocks of economic crises, and political instability. Positive significant impact is detected for the income per capita, shadow economy and political stability, as well as for terms of trade, borrowing constraints and young dependency ratio. On the other side significant negative impact is determined for income distribution, current account deficit, real interest rate, old dependency ratio and urbanization rate (Gök, 2014).

According to the analysis conducted in Namibia, inflation rate and income have significant positive impact on the saving rate, while population growth affects the saving rate negatively. Financial depth and deposit rate had no significant impact on savings. For the purpose of this analysis quarterly and annual data were used, and they were collected for the time period of 1991 to 2012. Recommendations made by the author for improving the saving rate include policies which would lead to increase in income levels and discourage further high population growth (Ogbokor, 2014).

APEC countries have also been a subject to the analysis of saving determinants. This empirical evidence included panel dataset for thirteen years, from 2000 to 2013. Significant positive relationship has been determined between saving rate and following variables - income, age dependency ratio, young population, rural population and urban population. According to the analysis conducted, financial depth is shown

to negatively affect the saving rate, while inflation and old population were detected as insignificant (Ariç K. H., 2015).

Another panel data analysis included thirteen Middle East countries. Data on eight independent variables, including government expenditure, money supply, income, inflation rate, young population ratio, urban population ratio and rural population ratio, were collected for the time period of 2000 – 2013. Positive impact on savings rate is detected by young population ratio and inflation rate. On the other side, money supply, government expenditures and income affect the savings negatively, but statistically significant. In the end, two variables whose impact is shown as insignificant are urban and rural population ratio (Ariç K. H., 2015).

Another study of saving determinants analyzes Southeast Asia and Latin America, in the time period between 1975 and 1995. Factors used as independent variables are central government balance, social security expenditure, growth, per capita income, pension fund saving, dependency ratio, inflation, M2 and terms of trade. According to the results, social security expenditure has the most significant impact on private savings in both regions. Two factors which could possibly explain the differences in private savings between the two regions are variables representing financial depth and macroeconomic stability (Dayal-Gulati & Thimann, 1997).

Therefore, the empirical literature abounds in analyses of savings, which are either expressed as dependent variable or analyzed in its relationship with economic growth rate. As such, presence of savings in research papers is not negligible and remains tempting research topic for economists.

3. DATA

In order to analyze the determinants of gross national savings in Western Balkan countries, data on the eleven indicators is collected, for the last sixteen years, for the Western Balkan countries – more precisely Albania, Bosnia and Herzegovina, Bulgaria, Macedonia, Montenegro, Romania and Serbia. All the data were obtained from the World Bank database, except investment data which originate from the IMF database.

4. METHODOLOGY

Model developed in this paper includes the following eleven variables: gross national savings, gross domestic product, gross domestic product growth, gross domestic savings, domestic credit, total investment, urban population, unemployment rate, inflation rate, deposit rate

and total age dependency. The available literature where the focus is set on savings in the economy provides a number of models containing various indicators that explain or do not explain savings as dependent variable. Referable literature models are chosen by following two conditions – availability of data on given variables for the Western Balkan countries and the sample size used in the mentioned models. Therefore, created model follows the example of the panel data analysis of the determinants of savings in APEC countries, from the year 2000 to 2013 (Ariç K. H., 2015). Further variations in the model are made by using the base of and combining twenty-eight potential predictor variables, all having theoretical background in available empirical literature, with the purpose of creating the best fitting model. The developed model can be presented by the following equations:

$$\mathbf{YGNSAV} = f(GDP, GDPGROWTH, GDS, DOMCREDIT, DEPTOT, URBAN, INFdefl, TOTINV, UNEMP, DEPRATE) \quad (1)$$

$$\mathbf{YGNSAV} = \beta 0 + \beta 1\ \mathbf{GDP}\ it - \beta 2\ \mathbf{GDPGROWTH}\ it + \beta 3\ \mathbf{GDS}\ it - \beta 4\ \mathbf{DOMCREDIT}\ it + \beta 5\ \mathbf{DEPTOT}\ it - \beta 6\ \mathbf{URBAN}\ it - \beta 7\ \mathbf{INFdefl}\ it + \beta 8\ \mathbf{TOTINV}\ it + \beta 9\ \mathbf{UNEMP}\ it - \beta 10\ \mathbf{DEPRATE}\ it + uit \quad (2)$$

where *i* symbolizes country and *t* symbolizes time; *i* = 1-7 countries and *t* = 2000-2015.

The aim of this paper is to examine the most significant determinants of national savings rate in Western Balkan countries in the last sixteen years. Accordingly, the null and alternative hypopaper are respectively set as following:

H_0: All values of the regression coefficients are equal to zero, (i.e., none of the regression coefficients affects the variation of the dependent variable)

H_1: At least one of the significant variables in the regression model explains the variation in the dependent variable

The panel dataset behind this model is characterized as strongly balanced. Firstly, the Hausman test is applied in order to decide whether to continue the analysis in accordance to fixed effects or random effects model. Furthermore, several tests are conducted in order to check if basic assumptions such as: heteroscedasticity, multicollinearity, correlation among residuals, normality of data distribution and autocorrelation are disturbed. To test for heteroscedasticity Modified Wald test is used, while the autocorrelation is tested through Wooldridge test for auto-

correlation. Correlation among residuals is examined using two tests - Pesaran and Breusch Pagan test. Multicollinearity among independent variables is shown through the correlation matrix. Furthermore, Shapiro Wilk test is implemented to check the normality of residuals distribution. Additionally, normality test for residuals is visually presented through three different graphs which are shown and explained in the following section, along with other results of analysis. All the tables and figures in the following section are product of author's calculations.

5. RESULTS

Table 2 summarizes means, standard deviations, minimum and maximum values of eleven variables used for the regression analysis. Dependent variable, gross national savings, has the mean value of 16.02. Minimum value of national savings in dataset belongs to Montenegro and it comes from the period of crisis, in 2008. On the other side, maximum value is obtained by Albania in 2001. Standard deviation from the gross national savings mean equals to 7.93 percent.

Table 1: Summary of variables used in regression model

Variable name	Notation	Measurement	Literature
Gross National Savings	**GNS**	Share of GDP	(Ariç K. H., 2015); (Khan & Abdullah, 2010); (Johnson, 2015)
Gross Domestic Product	**GDP**	Gross domestic product expressed in current US dollars	(Hussein & Thirlwall, 1999); (Jilani, Sheikh, Cheema, & Shaik, 2013)
Gross Domestic Product Growth	**GDPGROWTH**	Annual percentage growth rate of GDP at market prices based on constant local currency	(Ariç K. H., 2015); (Liberda & Tokarski, 1999);
Gross Domestic Savings	**GDS**	Share of GDP	(Ariç K. H., 2015); (Doker, Turkmena, & Emsenb, 2016);
Domestic credit	**DOMCREDIT**	Share of GDP	(Gök, 2014); (Hussein & Thirlwall, 1999);
Total Age dependency	**DEPTOT**	Ratio of dependents - people younger than 15 or older than 64 - to the working-age population	(Khan & Abdullah, 2010); (Doker, Turkmena, & Emsenb, 2016);
Urban population rate	**URBAN**	Percentage of total population	(Doker, Turkmena, & Emsenb, 2016); (Gök, 2014);
Inflation	**INFdefl**	Annual growth rate of the GDP implicit deflator	(Ariç K. H., 2015); (Khan & Abdullah, 2010); (Ogbokor, 2014);
Total Investment	**TOTINV**	Percentage of GDP	(Esmail, 2014)
Unemployment rate	**UNEMP**	Percentage of total labor force (ILO estimate)	(Gatt, 2014); (Esmail, 2014); (Doker, Turkmena, & Emsenb, 2016);

Table 2: Summary statistics

Variable	Obs	Mean	Std. Dev	Min	Max
GNSAV	111	16.02007	7.930749	-9.99	33.6
GDP	112	34.15657	48.93587	.985	209.664
GDPGROWTH	112	3.513391	3.208995	-7.066828	10.6579
GDS	111	6.29628	11.65303	-34.03465	25.05742
INFdefl	111	7.498498	12.61869	-.7482673	89.24465
DOMCREDIT	110	43.74273	18.32686	7.408676	87.98866
DEPTOT	112	46.81252	4.177143	39.19035	59.58587
URBAN	112	58.82376	13.19489	39.16	82.41289
UNEMP	105	18.68667	8.704553	5.6	37.3
TOTINV	96	25.21145	6.33875	10.548	40.671
DEPRATE	107	6.446196	8.38366	.6138917	78.7

GDP for all the countries is expressed in US dollars for the purpose of comparability. The mean value of GDP equals to 34.15 billion US dollars and standard deviation being equal to 48.93 billion US dollars. Minimum value is, once again, assigned to Montenegro in 2001, while the highest value in the sample is obtained by Romania in 2008 and equals to 209.664 billion dollars. Regarding the GDP growth, table shows the average to be equal to 3.51 percent, with standard deviation of 3.2 percent. Romania experienced the lowest growth rate among the countries of Western Balkan in the last sixteen years – the rate was equal to -7.06 in 2009, as a result significant drop in GDP compared to its peak in 2008. Maximum value of GDP growth, 10.65 percent, is obtained by Montenegro in 2007. Mean value of gross domestic savings is equal to 6.29 percent. Calculated standard deviation from the mean is 11.65 percent.

Minimum values between national and domestic savings differ significantly. The minimum value of gross domestic savings, which is equal to -34.03, is obtained by Bosnia and Herzegovina in 2003 and it indicates final consumption being higher than gross domestic product. During the whole period Bosnia's gross domestic saving rate was below zero. When it comes to inflation rate, minimum value of 0.74 is obtained by Bulgaria in 2013. On the other side, abnormally high rate of 89.24, also representing the maximum value in the sample, is noted in Serbia in 2001. Average inflation rate is 7.49, with standard deviations from the mean equal to 12.61 percent. There is also a notable difference between minimum and maximum value of domestic credit provided by financial institutions – minimum value, obtained by Montenegro in 2003, is equal to 7.4 obtained, while the maximum one, 87.98 percent,

is obtained by Romania. However in the rest of the observed period, amount of domestic credit in Montenegro was significantly higher, compared to the mentioned minimum value.

Furthermore, the lowest number of old and young dependents was present in Bosnia in 2010, while the highest ratio of dependents to working-age population was found in Albania in 2000. Values were equal to 39.19 and 59.58 percent, respectively. There were no significant fluctuations regarding this ratio. Its mean is calculated as 46.81, with standard deviation equal to 4.17 percent. Considering the urban population rate, expressed as percentage of total population, the calculated mean is equal to 58.82 percent, indicating more than half of urban population on average. However, there are certain differences between countries of Western Balkan, when it comes to urban and rural population. Minimum value of 39.16 percent is found in Bosnia and Herzegovina, while the country with the highest ratio of urban population in the last sixteen years was Macedonia – 82.41 percent. Standard deviation from the mean is 13.19 percent. Regarding unemployment, the minimum value in the sample belongs to Bulgaria – it was equal to 5.6 percent in 2008. Almost seven times higher maximum value, 37.3 percent, was present in Macedonia in 2005. Mean and standard deviation are equal to 18.68 and 8.7, respectively.

Furthermore, highest level of investment as portion of GDP, 40. 67 percent, was present in Montenegro in 2008, while Serbia, in 2000, had an unenviable level of investment, equal to 10.54 percent. Calculations show the average investment rate equal to 25.11 percent, with standard deviation of 6.33 percent. Last variable analyzed is deposit interest rate. Difference between minimum and maximum value is enormous and is equal to more than 78 percent. Minimum deposit rate was offered by commercial banks in Bulgaria – 0.64 percent in 2015, while the maximum one was offered in Serbia, in 2000. However, the deposit rate in Serbia returned to common levels right away in 2001. Average deposit rate is 6.44 percent indicating that the case with abnormally high deposit rate in Serbia was simply an outlier, not the general trend. Standard deviation from the mentioned average over the last sixteen years is equal to 8.38 percent. In the end, greatest variations in values are concluded within GDP, inflation, gross domestic saving and deposit rate.

After the regression is run, correlation between independent variables is investigated. The model does not seem to produce multicollinearity problem. As the table below shows, the correlation coefficients have values from – 0.7900 to 0.6785, meaning that none of the independent variables are critically correlated to each other.

Variable GDP is positively correlated with GDS, URBAN, TOT-

INV and DEPRATE, while having negative relationship with GDP-GROWTH, INFdefl, DOMCREDIT, DEPTOT and UNEMP. Further, GDPGROWTH is shown to have positive correlation with INFdefl, DEPTOT, TOTINV and DEPRATE, while being negatively correlated with the remaining variables. INFdefl showed negative correlation with all the variables except GDS, GDP and DEPTOT. GDS has negative correlation with all variables except DEPTOT, URBAN, DEPRATE and TOTINV, while DEPTOT is positively correlated to all variables except UNEMP and GDP. Variable URBAN shows negative correlation INFdefl, TOTINV, UNEMP and DEPRATE. TOTINV has negative correlation with UNEMP, DEPRATE, URBAN and INFdefl, while DEPRATE shows negative relationship with UNEMP, TOTINV, URBAN and DOMCREDIT. Lastly, UNEMP is only positively correlated with GDS.

The starting point in the process of testing the basic statistical assumptions was the Hausman test, where the null hypopaper states that there is no correlation between error components and explanatory variables (Hill, Griffiths, & Lim, 2011). Accordingly, if the test shows no correlation random effects are appropriate, while correlation between error components and explanatory variables suggest that fixed effects should be used. The results are presented in Table 4.

Table 3: Correlation Matrix

	GDP	GDP GROWTH	INFdefl	GDS	DOM CREDIT	DEPTOT	URBAN	TOT INV	UNEMP	DEP RATE
GDP	1.0000									
GDP GROWTH	-0.1537	1.000								
INFdefl	-0.0115	0.2620	1.0000							
GDS	0.5461	-0.0759	0.0192	1.0000						
DOM CREDIT	-0.1374	-0.3698	-0.3039	-0.0241	1.0000					
DEPTOT	-0.1104	0.2011	0.1702	0.3883	0.0109	1.0000				
URBAN	0.0920	-0.0884	-0.0425	0.4524	0.1268	0.2110	1.0000			
TOTINV	0.0521	0.3611	-0.2285	0.1612	0.2270	0.3528	-0.0931	1.0000		
UNEMP	-0.5700	-0.0755	-0.2218	-0.7900	0.1060	-0.3558	-0.4743	-0.3271	1.0000	
DEPRATE	0.0129	0.1122	0.6785	0.0822	-0.1019	0.1708	-0.1063	-0.2060	-0.2011	1.0000

Table 4: Hausman Test

chi2:	37.37
Prob>chi2:	**0.0000**

Having the Prob>chi2 equal to zero, the null hypopaper is rejected, which further implies the presence of correlation among error components and independent variables. In line with that, fixed effects are found to be appropriate for this model.

Table 5: Regression results for determinants of gross national saving rate (GNSAV)

Variable name	Coeff.	Std. Err.	t	p > | t |
GDP	.0477048	.014684	3.25	0.002
GDPGROWTH	-.324588	.113027	-2.87	0.005
INFdefl	.0899904	.0343417	2.62	0.000
GDS	.2869473	.0691227	4.15	0.000
DOMCREDIT	-.1666089	.0298008	-5.59	0.000
DEPTOT	1.199351	.1902926	6.30	0.000
URBAN	.612684	.2598161	2.36	0.021
TOTINV	.0372505	.0942387	0.40	0.694
UNEMP	.0958059	.124569	0.77	0.444
DEPRATE	-.0587322	.0465668	-1.26	0.211
_cons	-72.64173	22.56075	-3.22	0.002
R^2 = 0.7039	F = 16.40		Prob>F = 0.0000	

Table above shows R^2 of this model to be 0.7039, meaning that about 70 percent of variations in dependent variable, gross national savings, are explained by the listed independent variables. Finally, the indicator Prob>F=0.0000 states that all coefficients within the model are different than zero, making the model statistically significant and acceptable.

Correlation among residuals is tested through two tests – Pesaran

and Breusch Pagan. It is known how cross-sectional dependence may lead to bias in tests results. Null hypotheses in both tests state that residuals are not correlated across entities.

Table 6: Pesaran test

Cross sectional independence:	-0.701
Prob:	**0.4830**

The null hypopaper in Pesaran test is accepted, meaning that there is no cross sectional dependence.

Table 7: Breusch Pagan LM Test for Independence

chi2:	14.991
Prob:	**0.4521**

Results of Breusch Pagan LM test for independence support the Pesaran test results, as the null hypopaper is accepted again. Therefore, both tests suggest no correlation among residuals.

To test for the normality of residuals distribution, Shapiro-Wilk test for normal data is used. The null hypopaper states that residuals are normally distributed. As the result of this test shows Prob>z being equal to 0.07915, therefore higher than 0.05, the null hypopaper is accepted and it can be said that residuals here are normally distributed.

Table 8: Shapiro-Wilk Test for Normal Data

z:	1.411
Prob > z:	0.07915

Normality of residuals distribution is then inspected visually. Firstly, Kernel density estimation is used to plot the distribution of the residuals and compare it to the normal one, as shown on the Figure 1. Generally, it can be concluded that residuals follow the normal distribution indicated by the red line. Present deviations from the normal density shown on the figure below could possibly be explained by several missing values in the sample caused by the lack of the data.

Figure 1: Kernel density estimate compared to normal density

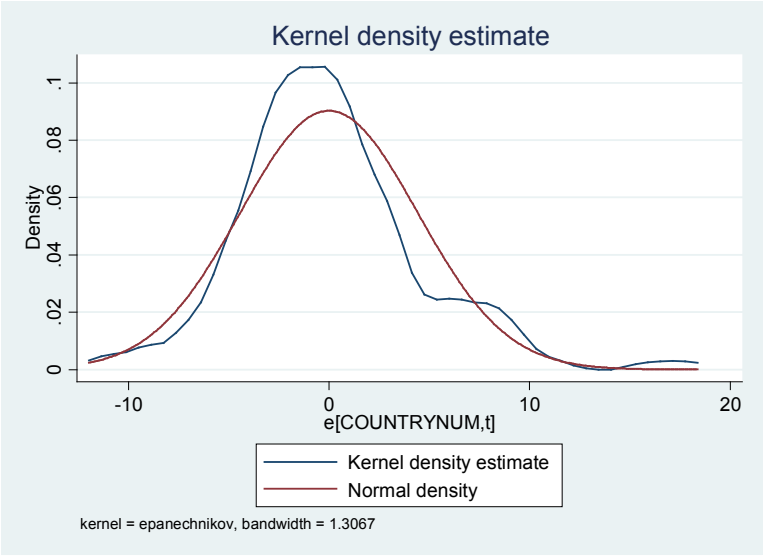

Figure 2: Standardized normal probability plot & plot of quantiles of residuals against quantiles of normal distribution

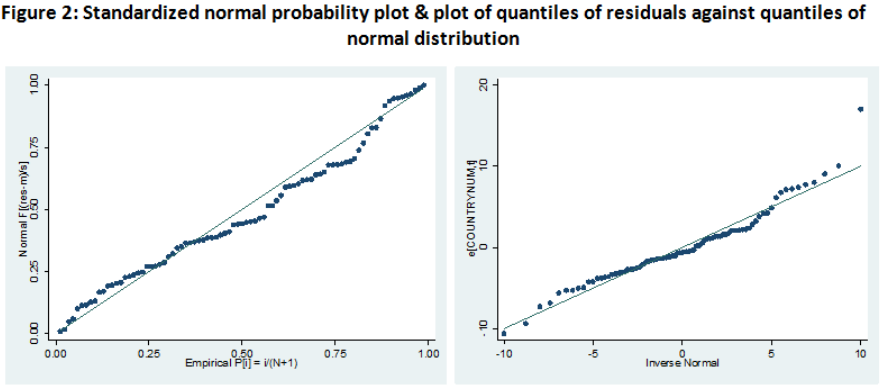

Figure 22 shows two plots – left one presents standardized normal probability plot, while the right one plots quantiles of the residuals against the quantiles of the normal distribution. On the one side, stand-

ardized normal probability plot tests non-normality in the middle range of residuals, while on other side, quintile-normal plots investigates non-normality in the extremes of the data, meaning tails. Both figures show slight deviations from the normal but not extreme. As mentioned in the previous section, the model is tested for heteroscedasticity using the Modified Wald test for group wise heteroscedasticity in fixed effect regression model. The null hypopaper here means homoscedasticity or constant variance. Having Prob>chi2 equal to zero means the null hypopaper is rejected and the presence of heteroscedasticity is detected.

Table 9: Modified Wald Test

chi2:	223.70
Prob>chi2:	0.0000

Autocorrelation in the model is tested using Wooldridge test for autocorrelation in panel data. The null hypopaper here is that there is no serial correlation. Having the Prob>F equal to 0.0004, the null hypopaper must be rejected which further implies the presence of autocorrelation, as shown in the table below.

Table 10: Wooldridge Test

F(1,5):	68.848
Prob>F:	**0.0004**

Having both heteroscedasticity and autocorrelation detected, the option cluster is used, where data are clustered by COUNTRYNUM – meaning country number, where a unique number is allocated to each country. After the regression is run with the cluster option, standard errors are adjusted and the significance of variables increased, mostly. Table below (Table 11) compares the results before and after the model is treated for correlation and heteroscedasticity with the named command.

In order to test significance, obtained t statistics are compared to critical t-value at 5% significance level, more precisely critical t-value of 1.96. According to the table above, the model produced seven significant variables – GDP, GDPGROWTH, INFdefl, GDS, DOMCREDIT, DEPTOT and URBAN, and three insignificant variables – TOTINV,

UNEMP and DEPRATE.

Gross domestic product is shown to be statistically significant, with t-value equal to 4.15, and as the results indicate, one unit increase in GDP leads to 0.047 percent increase in gross national saving rate. The same path was expected for GDP growth, however, regression results showed variable GDPGROWTH to have statistically significant negative relationship with saving rate, with t-value equal to -3.53. Each percentage increase in GDP growth rate is expected to lead to about 0.324 percent decrease in saving rate. Further, inflation is shown to be statistically significant, given its t-value equal to 2.89. Such result is expected as the theory explains that the higher the inflation, the more people try to avoid uncertainty by saving more. Each percentage increase in inflation should lead to 0.089 percent increase in saving rate. Another significant variable are gross domestic savings, where each percentage increase is expected to increase the saving rate by 0.286 percent.

Table 11: Regression results after solving for heteroskedasticity and autocorrelation

	Before cluster adjustment		After cluster adjustment	
Variable name	**Std. Err.**	**t**	**Std. Err.**	**t**
GDP	.014684	3.25	.0114838	4.15
GDPGROWTH	.113027	-2.87	.0919357	-3.53
INFdefl	.0343417	2.62	.0311036	2.89
GDS	.0691227	4.15	.0896402	3.20
DOMCREDIT	.0298008	-5.59	.0357009	-4.67
DEPTOT	.1902926	6.30	.1389631	8.63
URBAN	.2598161	2.36	.2315193	2.65
TOTINV	.0942387	0.40	.1603813	0.23
UNEMP	.124569	0.77	.1319171	0.73
DEPRATE	.0465668	-1.26	.041765	-1.41
_cons	22.56075	-3.22	21.95788	-3.31

Unusual result is obtained regarding the amount of domestic credit provided by financial institutions, where, according to theory, increase in domestic credit increases investments and therefore the saving rate.

However, variable DOMCREDIT is shown to have statistically significant negative relationship with the national saving rate and each increase in percentage ratio of DOMCREDIT in GDP, decreases the saving rate by 0.166 percent. Similarly, ratio of dependents to the working age population was expected to negatively affect the saving rate, however, the results produced by the model showed that as the mentioned ratio increases, so does the saving rate. More precisely, as the percentage of age dependents by one unit, saving rate increases by one percent. The last significant variable is URBAN, representing the ratio of urban population to the total population. Theory shows different results. While on the one side, it is expected that the increase in urban population also increases the saving rate due to the greater number of commercial bank branches in urban areas, on the other side, as explained in the previous section, several studies showed that rural population tends to save more than the urban one. In this model, URBAN variable has statistically significant positive relationship with national saving rate, and as the ratio of urban to total population increases by 1 percent, the saving rate increases by 0.61 percent.

Investment, unemployment and deposit rate are statistically insignificant with t-values equal to 0.23, 0.73 and -1.41, respectively. Even though they are shown to be insignificant, signs in front of unemployment and deposit rate variables are opposite of what is expected. Unemployment should negatively affect saving rate, meaning that every increase in unemployment rate is expected to decrease saving rate, while deposit rate was expected to positively affect saving – increase in deposit rate should induce people to save more.

6. DISCUSSION

The aim of this section is to comment and discuss the significance of variables in the model and, considering the obtained results, to provide an insight into potential policies which could lead to higher saving rates in Western Balkan countries. As the model shows, the most statistically significant determinant of national saving rate is total age dependency. However, unlike the logic dictates and theory suggests, increase in the total age dependency ratio, in this model, leads to increase in the saving rate. Considering the fact that people under 15 are not able to obtain regular income, and that those over 65 receive less than the population aged 15 to 64, the larger the mentioned ratio – the lower the saving rate.

The opposite relationship is simply not supported by the economic theory. Possible explanation for such occurrence in this model lies in the background of the named variable. As already discussed in the second section of this paper, total age dependency ratio is calculated as

the ratio of people under 15 and over 65, to the rest of the population, here presented as "the working-age population". The problem occurs for two reasons. Firstly, not all the "working-age population" is economically active and able to work. Secondly, not all the people over 65 are automatically retired, but are able to work and earn additional incomes. Furthermore, if the focus is put on the elderly, it is important to mention the enormous difference between the pension amounts in countries of Balkan and those in the rest of the Europe. Therefore it can be assumed that population older than 65 in the region of interest is more prone to saving, despite lower incomes, due to the fact that their future is uncertain. For the above reasons, the coefficient sign in front of the total age dependency variable could be justified.

Another variable that is shown to positively affect national saving rate is GDP. Unlike the previous variable, this one is supported by the available literature, as referenced in the previous section. Given that GDP is frequently used as an indicator of well-being and standard of living in a certain country, it comes naturally to expect an increase in GDP to cause increase in the national saving rate.

A variable whose interpretation is ambiguous throughout the literature is inflation. On the one side, inflation could decrease the ability of residents to save due to general rise in prices. On the other side, it could force residents to save more, despite the increase in prices, to avoid uncertainty and provide themselves as much safeness and stability as possible. Model developed in this paper supports the latter assumption – the greater the inflation, the higher the saving rate.

Along with inflation, the ratio of urban population has also been interpreted from two different perspectives. According to the model developed in this paper, as the rate of urban population rises, so does the saving rate. This contrasts with the existing view that rural population spends less than the urban one. In 1990, there was a survey conducted in Philippines in order to further investigate the saving behavior among rural and urban households (Bautista & Lamberte, 1990). The study showed that rural population tends to save more despite lower incomes when compared to urban population. On the other side, several studies report high significance of urban population ratio, as a positive determinant of saving rate. There are several facts supporting such occurrence. First of all, people move to urban areas either for employment or education. When considering employment and higher payments in urban than in rural areas, higher disposable income is assumed and therefore more space left for saving. Even though the cost of living in an urban area I higher than in rural area, higher density of commercial banks in cities contributes to general willingness to save. Furthermore, urban popula-

tion tends to be better informed about saving conditions, deposit rates and their investment opportunities. For all the stated reasons, positive relationship between urban population ratio and saving rate is justified.

Another explanatory variable that showed positive effect is the portion of gross domestic savings in the GDP. It is important to state the difference between these two in order to comment on the significance. Gross national savings, as dependent variable, is expressed as the difference between gross national income and total consumption, plus net transfers. On the other side, gross domestic savings are calculated as GDP minus total consumption. Both are expressed as percentage of GDP. Essentially, these two differ in two ways. Firstly, the starting point in calculation for gross national savings is gross national income, while for gross domestic savings it is gross domestic product. Secondly, gross national savings take into account net transfers, while gross domestic savings don't. Therefore, gross domestic savings as a variable show the effect of that what is produced within the borders of the country less total consumption, without any transfers. Finally, what does that mean for the Western Balkan countries? Generally, the greater the share and significance of gross domestic savings in gross national savings, the better it is, as greater share means less dependence on foreign funding for domestic investments.

Among the seven significant variables that model produced, there are two of them having negative relationship with the gross national saving rate – GDP growth and domestic credit. Starting with the GDP growth, it can be freely said that the negative relationship between growth and saving is the most unusual result of all. However, this does not mean that less growth is beneficial for savings. Growth simply presents annual percentage change of GDP in current year compared to the previous one. Even if the growth rate is not higher than the previous one obtained, it still presents growth in essence, as long as it is not negative. For the same reason, the model developed in this paper includes both GDP and GDP growth as explanatory variables. Therefore, it cannot be concluded that suppressing the growth rate leads to higher saving rate, as the model showed positive effect of GDP. It can simply be stated that comparing the current GDP to the previously obtained one, and expressing it as a percentage does not work well when determining the saving rate.

Another variable that is shown to have significantly negative effect on savings is the amount of domestic credit provided by financial institutions. This variable is included in the model as an indicator of banking sector depth and financial sector development. Such effect is unexpected, once again, as the more credit is provided by financial institutions,

the greater the investment, and therefore greater the savings. However, an IMF paper from 1990 suggests the opposite. According to the paper, restrictive credit policies tend to increase the domestic interest rates and therefore stimulate private savings. In order to finance their investments, households would be forced to shrink their consumption, and therefore increase the amount of savings (Aghevli, James Boughton, Villanueva, & Woglom, 1990). Therefore, such relationship between domestic credit and saving rate can be explained through unfavorable interest rates that cause population to save more.

One of the aims of this paper is to, using the results obtained by the model, form a recommendation that would lead to higher rate of national savings. Considering several unusual and unexpected projections of the model, where simply following what the model suggests could even harm the economy, I decided to focus on determinants whose influence on saving and the overall economy is not debatable.

As already stated, concluding the negative influence of growth rate on savings and developing policies in that direction is simply not economically acceptable, as GDP growth rate usually serves as an indicator of the overall economic health. Furthermore, a significant shift from rural to urban areas could also have negative impact on the economy, considering the great importance of rural population for the development of agriculture sector, given the potential that Western Balkan countries have for this economic branch. Also, policies which would lead to higher total age dependency do not make sense as the general goal is to loosen the burden put on the working-age population, not to further magnify it.

What is left to focus on are GDP and gross domestic savings, with GDP also being a building part of domestic savings. Therefore, any policy which increases productivity, boosts well-being and improves standard of living is considered the right one. Furthermore, attention should be paid to the bank and non-bank services development. Financial inclusion in this region remains on unenviable level, and it should have been greater considering the credit-to-GDP ratios in these countries. Term "financial inclusion" here refers to the number of banks and ATM machines density. In addition, only 57 percent of adults, on average, owns a bank account which automatically translates into low saving rates in this region (IMF, 2015). Despite the fact that deposit rate is shown to be insignificant factor in determination of the saving rate, a favorable deposit interest rate could induce people to deposit their funds and earn certain return, instead of spending it. Furthermore, range of savings instruments should be expanded. Hopefully, it would increase the amount of formal savings which could then be directed to various

productive projects, accelerating the growth of the economy and increasing its capacity to produce. In the end, it would lead to higher GDP and, as the model suggests, higher saving rate.

7. CONCLUSION

Achieving a high and stable economic growth rate is an important issue for every economy. Savings, as the difference between gross national income and total consumption, along with net transfers, present a fundamental element of development, and as such are research subject of numerous studies.

The aim of this paper was to investigate the determinants of saving in Western Balkan countries and to, using the available empirical examples and considering the data availability, form the best fitting model possible.

For the purpose of analysis, data about the needed variables are gathered, for the time period between 2000 and 2015. After the cross-country analysis is presented, where the variables used in the model are compared among between seven Western Balkan countries, the model is developed. The model includes eleven variables, where gross national savings are the dependent variable, while independent variables are GDP, GDP growth, gross domestic saving rate, inflation rate, domestic credit, total age dependency, urban population ratio, unemployment rate, total investment and deposit interest rate.

According to the model, total investment rate, unemployment rate and deposit rate are irrelevant when determining the saving rate, given the used sample.

The impact of certain variables, such as GDP and gross domestic savings, are completely supported by the available literature. On the other side, impact of inflation rate, urban population ratio and domestic credit is ambiguous and can be interpreted in both directions, both in the available empirical examples and in the model developed in this paper. Finally, the impact of growth rate and total age dependency is unexpected and opposite of what theory suggests.

Considering the results of the developed model, the recommended policies focus on stimulating domestic production, increasing productivity and per capita incomes. Along with the mentioned, financial inclusion in this region deserves more attention as well as development of various saving instruments. In the end, the general tendency of deposit rates to decrease over the last eight years should be controlled and possibly reversed in order to induce the population to save more.

As already mentioned, this study had certain limitations. Given that

the area of interest were Western Balkan countries, data unavailability presented a huge problem when choosing the variables for the model. However, this study leaves space for further investigation, when more data is available, keeping in mind, especially, the lack of research on this topic for the named region. Another recommendation for further research concerns the dependent variable. This model used the gross national savings, expressed as percentage of GDP, as the dependent variable, following the example of some empirical evidences.

However, it is important to state that gross national savings are savings on national basis, as the name says. That means that is does not measure specifically the amount of private and public savings, and how much population actually decides to save, but rather presents the difference between the values created and consumed, on the national level. Therefore, using the actual amount of deposits in financial institutions, as dependent variable, could probably provide better insight into the saving behavior in certain economy or region. That way, it could clearly be seen what economic circumstances and conditions induce people and business to save and policies could be formed to directly influence the further willingness to save, and along with saving, to invest and therefore contribute to the overall growth.

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